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CARDIOVASCULAR FLASHLIGHT

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Isolation of the right subclavian artery in interrupted aortic arch

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A 15-day-old newborn presented with cardiovascular shock. Upon clinical suspicion of congenital heart disease (CHD), medical treatment was initiated. Echocardiography showed a left-sided interrupted aortic arch Type B and a large ventricular septal defect (VSD). Magnetic resonance imaging (MRI) was requested for preoperative exact anatomical delineation of the interrupted aortic arch and of its branches. Additionally, MR angiography depicted an isolated right subclavian artery originating from the right pulmonary artery (Figure). Two days later, the patient underwent successful surgical repair with reconstruction of the aortic arch, VSD-closure, and re-implantation of the right subclavian artery into the aortic arch.

Origin of the subclavian artery from the pulmonary artery is a rare anomaly of the aortic arch. It is defined as a loss of continuity between the subclavian artery and the aorta, with a persistent connection to the homolateral pulmonary artery through a patent ductus arteriosus. It is mostly associated with intracardiac or aortic arch anomalies. Embryologically, isolation of the subclavian artery always occurs on the contralateral side of the aortic arch. The right subclavian artery is four times less frequently involved than the left one. This lesion is usually asymptomatic and mainly recognized during evaluation of CHD. Patients may present with diminished blood pressure or lower oxygen saturation in the involved arm; pulmonary or subclavian steal syndrome can occur.

The incidence of microdeletion 22q11 in patients with interrupted aortic arch is 55%. In patients with an additional anomaly of the subclavian artery, the incidence may rise up to 81%.

Figure. Contrast-enhanced MR angiography: (A) anterior view, (B) left anterior oblique view, (C) right anterior oblique view, (D) 3D reconstruction, posterior view. Double asterisks show right subclavian artery arising from RPA. LSA, left subclavian artery; RPA, right pulmonary artery; AOA, ascending aorta; AOD, descending aorta; LV, left ventricle; RV, right ventricle; VSD, ventricular septal defect; PDA, persistent ductus arteriosus; MPA, main pulmonary artery; LA, left atrium.

